Jianqiao Leng

Professional Summary June 6, 2025

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Professional Preparation

Academic Background

Ph.D., Petroleum Engineering, Missouri University of Science and Technology, May 2022 Master of Science, Petroleum Engineering, University of Southern California, December 2015 Bachelor of Science, Marine Science, China University of Geosciences (Beijing), June 2012

Professional Appointments

- Flow Modeler (Research Scientist Associate III), Dr. JP-Nicot (May 2023-Present) Part 1. Research of Injection Induced Seismicity in Permian Basin: -Collection and analysis of geological data such as well logging, seismic data and core samples in shallow formations in Delaware basin (Delaware Mountain Group) -Geo-model design in SLB Petrel to generate permeability, porosity, grids and facies properties -Hydrogeological pore pressure model setup in CMG STARS to model the dynamic fluid flow -Simulation of water injection in the basin for 40 years and analysis of pore pressure evolution in spatial and temporal dimensions -Results indicated strong seismicity potential near TX/NM border due to extensive injection and the conclusions consistent with InSAR vision of surface elevation in the same region -Presentations of pore pressure model in several sponsor meetings Part 2. Reservoir Anisotropy Analysis: -Collection and analysis of field operation data from oil and gas company in Deep Midland basin -Applied capacitance resistance method to predict the inter-well connectivity -Developed mathematical algorithms to solve the nonlinear system and programmed the Python code -Upscaled inter-well connectivity to field scale and to estimate the anisotropy in Deep Midland basin -Evaluated the impact of disposal water injection in Deep Midland basin on induced seismicity -Presentations of results in 2023 and 2024 AGU conferences.
- Postdoc, Seyyed A. Hosseini (September 2022-May 2023) Research project funded by Department of Energy (DOE): Science-informed Machine Learning for Accelerating Real-Time Decisions in Subsurface Applications (SMART) Initiative, Phase 2 Task 5: -Built base model using SLB PETREL and CMG GEM&CMOST software based on geological data in Gulf of Mexico and designed training and testing dataset for machine learning studies. -Leveraged machine learning in geosystems and applied scientific machine learning (SciML) models to history match the explorations in Gulf of Mexico carbon sequestration pilot. -Applied autoencoder and LSTM in forecasting carbon sequestration performance to improve prediction efficiency and succeeded to reduce prediction temporal cost over 2000 times than conventional simulation methods. - Presentations in sponsor technical seminars •Research project funded by Gulf Coast Carbon Center (GCCC): Screening of Reservoir Candidates in Gulf of Mexico for CO2 Geological Storage: -Data collection, classification and mining of geological and petroleum exploration data in Gulf of Mexico -Descriptive statistical analysis of geological data in Gulf of Mexico to design the meta data for machine learning studies Factors importance ranking of meta data related to the CO2 storage capacity using random forest -Screening criteria and workflow design in selecting candidate reservoirs for large scale geological storage of CO2 in Gulf of Mexico -Paper publication and presentation in 2023 ATCE conference and GoMCarb sponsor meeting

Postdoc, Dr. Baojun Bai (May-September 2022) •Data Preservation and Visualization Project -Collected raw data from over 50 features from 140 injection wells with gel treatment in Karamay oil field in 2014 to 2020 -Selected thirteen critical features as independent variables (Feature engineering) -Constructed a four-in-one data analytics platform with user interface including data visualization, statistics, feature importance estimation and prediction functions using MATLAB app designer -The app can provide machine learning functions based on the database and user input (Polynomial, Random Forest, Support Vector Machine, ANN, KNN, Decision Tree) to build and compare forecast model results with actual results of gel treatment performance

Professional Registrations and Certificates

•IBM Data Science Specialization •Python for Data Science and AI •Machine Learning with Python •AI and Data Engineering Practical Training (Laioffer) •CMG Certificate of Reservoir Simulation Model Creation & Analysis using BUILDER & RESULTS •CMG Certificate of Chemical EOR using STARS & CMOST

Dissertations

Numerical simulation study of gel treatment for conformance control from lab to field Leng, J. (2022). Numerical simulation study of gel treatment for conformance control from lab to field (Order No. 29161157). Available from ProQuest Dissertations & Theses Global. (2700555822). Retrieved from https://ezproxy.lib.utexas.edu/login?url=https://www.proquest.com/dissertations-theses/numerical-simulation-study-gel-treatment/docview/2700555822/se-2, Missouri University of Science and Technology, 2022.

Areas of Expertise

Areas of Expertise

Numerical Reservoir Simulation; Enhanced Oil Recovery; Gel Treatment for Conformance Control; Carbon Utilization, Storage and Sequestration; Induced Seismicity;

<u>Awards</u>

Awards and Honorary Societies

• Society for Mining, Metallurgy & Exploration (SME) WAAIME scholarship 2020 and 2021, 2020-2021

Teaching and Advising

University Courses Taught

Teaching assistant in course "Petroleum fluid": presented to Missouri University of Science and Technology, Rolla, MO, January 13-May 7, 2022.

- Teaching Assistant in course "Application of Data Science in Petroleum Engineering": presented to Missouri University of Science and Technology, Rolla, MO, January 10-May 12, 2019.
- Teaching Assistant in course "Advanced reservoir simulation": presented to Missouri University of Science and Technology, Rolla, MO, August 12-December 15, 2018.

Presentations

Presentations

- Estimation of Formation Permeability Anisotropy in Delaware Mountain Group Using Injection Data in Water Disposal Project: presented to Industry technical session, presented at 2024 American Geophysical Union, Washington, D.C., December 9-13, 2024.
- Injection Pore Pressure Model in the Delaware Mountain Group, v. 2: presented to Industry Sponsor Meeting, presented at 2024 CISR-Science Advisory Committee Meeting, Austin, TX, December 5-6, 2024.
- Investigation of Inter-well Connectivity of the Ellenburger Formation in Central Midland Basin using a Rapid CRM Method: presented to Industry technical session, presented at American Geophysical Union 2023, San Francisco, December 11-15, 2023.
- A CRM-Based Method for Forecasting Interwell Connectivity Using Injection Data: presented to Industry Sponsor Meeting, presented at 2023 CISR-Science Advisory Committee Meeting, Austin, TX, December 9, 2023.

- A data analytics and machine learning study on site screening of CO2 geological storage in depleted oil and gas reservoirs in the Gulf of Mexico: presented to Industry technical session, presented at SPE Annual Technical Conference and Exhibition, San Antonio, October 16-18, 2023.
- A Physics-Based Method for Forecasting Interwell Connectivity Using Injection Data: presented to Industry technical session, presented at The International Meeting for Applied Geoscience & Energy, Houston, August 28-September 1, 2023.
- A machine learning study on CO2 storage prediction and decision-making in depleted oil and gas reservoirs in the Gulf of Mexico: presented to Industry technical session, presented at CCUS 2023, Houston, April 25, 2023.
- Data Analytics of BOEM Dataset for CO2 Storage in Gulf of Mexico: presented to Industry Sponsor Meeting, presented at 2023 Joint Annual GoMCarb - SECARB Offshore Partnerships' Meeting, Austin, TX, April 5-7, 2023.
- Impact of rheology models on horizontal well polymer flooding in a heavy oil reservoir on Alaska North Slope: a simulation study: presented to Industry technical session, presented at Offshore Technology Conference 2021, Houston, August 16-19, 2021.
- Simulation Study of Macromolecules Propagation Mechanism in Heterogeneous Porous Media: presented to Industry technical session, presented at AIChE Annual Meeting 2019, Orlando, FL, November 15, 2019.

Publications

Peer Reviewed Journal Articles

- Guo, R., Wang, H., Leng, J., and Hosseini, S. A., 2025, Evaluation of hydrogen leakage through abandoned wells to overlaying saline aquifers during underground hydrogen storage in depleted natural gas reservoirs: Gas Science and Engineering, v. 140, no. 205659, 11 p., http://doi.org/10.1016/j.jgsce.2025.205659.
- Ge, J., Nicot, J.-P., Smye, K. M., Calle, A. Z., Hennings, P., Horne, E. A., and Leng, J., 2024, Modeling the evolution of pore pressure from deep wastewater injection in the Midland Basin, Texas: AAPG Bulletin, v. 108, no. 12, p. 2287–2312, http://doi.org/10.1306/09102424008.
- Leng, J., Bump, A., Hosseini, S. A., Meckel, T. A., Wang, Z., and Wang, H., 2024, A comprehensive review of efficient capacity estimation for large-scale CO2 geological storage: Gas Science and Engineering, v. 126, no. 205339, 19 p., http://doi.org/10.1016/j.jgsce.2024.205339.
- Wang, H., Hosseini, S. A., Tartakovsky, A. M., Leng, J., and Fan, M., 2024, A deep learning-based workflow for fast prediction of 3D state variables in geological carbon storage: a dimension reduction approach: Journal of Hydrology, v. 636, no. 131219, 18 p., http://doi.org/10.1016/j.jhydrol.2024.131219.
- Bai, B., Leng, J., and Wei, M., 2022, A comprehensive review of in-situ polymer gel simulation for conformance control: Petroleum Science, v. 19, no. 1, p. 189–202, http://doi.org/10.1016/j.petsci.2021.09.041.
- Leng, J., Wei, M. and Bai, B., 2022, Impact of Polymer Rheology on Gel Treatment Performance of Horizontal Wells with Severe Channeling: SPE Journal, v. 27, no. 02, p. 1017–1035, http://doi.org/10.2118/209190-PA.
- Leng, J., Sun, X., Wei, M., and Bai, B., 2022, A Novel Numerical Model of Gelant Inaccessible Pore Volume for In Situ Gel Treatment: Gels, v. 8(6), p. 375, http://doi.org/10.3390/gels8060375.
- Leng, J., Wei, M., and Bai, B., 2021, Review of transport mechanisms and numerical simulation studies of preformed particle gel for conformance control: Journal of Petroleum Science and Engineering, v. 206, no. 0920-4105, p. 109051, http://doi.org/10.1016/j.petrol.2021.109051.
- Zhao, Y., Leng, J., Lin, B., Wei, M., and Bai, B., 2021, Experimental Study of Microgel Conformance-Control Treatment for a Polymer-Flooding Reservoir Containing Superpermeable Channels: SPE Journal, v. 26, no. 4, p. 2305–2317, http://doi.org/10.2118/205486-PA.
- Zhao, Y., Wei, M., Leng, J., and Bai, B., 2021, Propagation of Swellable Microgels through Superpermeable Channels: Impact of Particle–Pore Matching Size Relationship: Energy & Fuels, v. 35, no. 22, p. 18533–18542, http://doi.org/10.1021/acs.energyfuels.1c03030.

Non-Peer Reviewed Journal Articles

- Ya, Y., Wei, M., Cui, Y., Ali, M., Leng, J., and Qiu, Y., 2024, Prediction of Surfactant Performance from Surfactant Huff-Puff in Carbonate Reservoirs Using a Data-Driven Approach and Desktop Application Development: SPE Western Regional Meeting, SPE-218875-MS p., http://doi.org/10.2118/218875-MS.
- Yao, Y., Wei, M., Qiu, Y., Cui, Y., and Leng, J., 2024, Pattern Recognition for Wettability Alteration with Surfactants in Carbonate Reservoirs by Using Machine Learning: SPE Improved Oil Recovery Conference, SPE-218216-MS p., http://doi.org/10.2118/218216-MS.
- Leng, J., Nicot, J.-P., Smye, K. G., and Hennings, P., 2023, A Physics-Based Method for Forecasting Interwell Connectivity Using Injection Data: The International Meeting for Applied Geoscience & Energy, http://doi.org/10.1190/image2023-390998.
- Leng, J., Wang, H., and Hosseini, S. A., 2023, A data analytics and machine learning study on site screening of CO2 geological storage in depleted oil and gas reservoirs in the Gulf of Mexico: SPE Annual Technical Conference and Exhibition (ATCE), SPE-214866-MS p., http://doi.org/10.2118/214866-MS.
- Wang, H., Guo, R., Leng, J., Hosseini, S. A., and Fan, M., 2023, A Comparative Study of Deep Learning Models for Fracture and Pore Space Segmentation in Synthetic Fractured Digital Rocks: SPE Annual Technical Conference and Exhibition, SPE-215117-MS p., http://doi.org/10.2118/215117-MS.
- Leng, J., 2021, Research reviews the impact of rheology models on the injection profile and recovery improvement of horizontal well polymer flooding in a heavy oil reservoir on Alaska's North: Hartenergy E&P Plus, v. 96, no. 2, p. 56.
- Leng, J., 2021, Simulation Study of Macromolecules Inaccessible Pore Volume Mechanism in Heterogeneous Porous Media: International Journal of Science and Research (IJSR), v. 10, no. 7, p. 396-403, https://www.ijsr.net/archive/v10i7/SR21707020613.pdf.
- Leng, J., Wei, M., Bai, B., Seright, R. S., Zhang, Y., Cercone, D., and Ning, S., 2021, Impact of rheology models on horizontal well polymer flooding in a heavy oil reservoir on Alaska North Slope: a simulation study: Offshore Technology Conference, OTC-31087-MS p., http://doi.org/10.4043/31087-MS.

Published Abstracts

- Guo, R., Wang, H., Leng, J., and Hosseini, S. A., 2025, Leakage assessment of hydrogen through abandoned wells in depleted gas reservoir for underground hydrogen storage (abs.): AGU Fall Meeting 2024, no. H43N-1066.
- Leng, J., Nicot, J.-P., Ge, J., Wang, H., and Smye, K. G., 2024, Estimation of Formation Permeability Anisotropy in Delaware Mountain Group Using Injection Data in Water Disposal Project (abs.): American Geophysical Union (AGU2024), v. 852, no. H43A-0852, https://agu.confex.com/agu/agu24/meetingapp.cgi/Paper/1655640.
- Leng, J., 2023, A Deep Learning-Based Workflow for Fast Prediction of 3D State Variables in Geological Carbon Storage: A Dimension Reduction Approach (abs.): AGU2023, no. id. H31I-03, https://ui.adsabs.harvard.edu/abs/2023AG.
- Leng, J., Nicot, J.-P., Ge, J., Hennings, P., and Smye, K. G., 2023, Investigation of Inter-well Connectivity of the Ellenburger Formation in Central Midland Basin using a Rapid CRM Method (abs.): American Geophysical Union (AGU2023), no. Abstract ID 1392927, Paper No. S51A-07 p., https://ui.adsabs.harvard.edu/abs/2023AGUFM.S51A..07L/abstract.
- Leng, J., Nicot, J.-P., Smye, K. G., and Hennings, P., 2023, A Physics-Based Method for Forecasting Interwell Connectivity Using Injection Data (ext. abs.): The International Meeting for Applied Geoscience & Energy, no. ID 3909986, http://doi.org/10.1190/image2023-390998.
- Leng, J., Zhao, Y., Bai, B., & Wei, M. (2019). Simulation Study of Macromolecules Propagation Mechanism in Heterogeneous Porous Media. AIChE Annual Meeting. AIChE
- Zhao, Y., Yin, S., Leng, J., & Bai, B. (2019, November). Experimental Investigation of Synergy between Low Salinity and Polymer Flooding in Enhancing Heavy Oil Recovery on Alaska North Slope. In 2019 AIChE Annual Meeting. AIChE.